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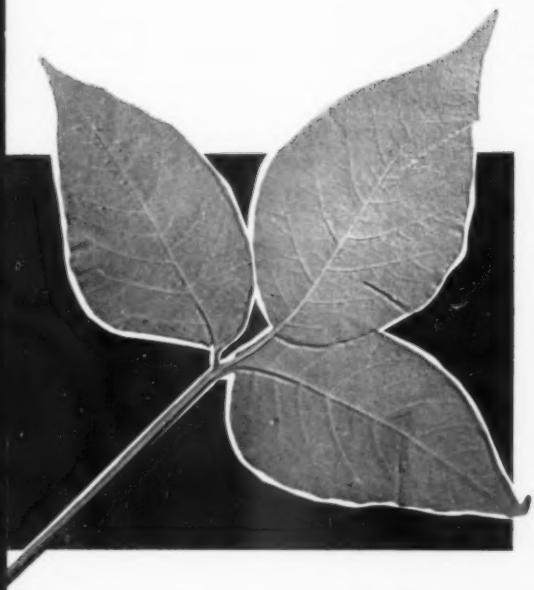
NEW YORK STATE COLLEGE OF AGRICULTURE

Poison Ivy

and

Poison Sumac



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Poison Ivy and Poison Sumac

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Many plants have been shown capable of producing skin poisoning, but poison sumac and especially poison ivy cause discomfort to thousands of individuals each year in New York State, even though it is generally known that contact with these plants may produce severe inflamation of the skin. In many of these cases, suffering could have been prevented if the victim had been able to recognize these plants and thus avoid contact, if he had known how to eradicate them and to prevent the possibility of contact, or had known what to do immediately after accidental contact.

The numerous inquiries received every year concerning the identification and the eradication of poison ivy indicate a necessity to make readily available the most important facts concerning this plant. It is in response to this need that the following brief summary of the description, the distribution, the eradication, and the treatment of poison ivy and its relative, poison sumac, has been prepared.

Poison Ivy

(*Rhus Toxicondendron* L.)

Description

Other names: *poison oak, poison creeper, climbing sumac, three-leaved ivy.*

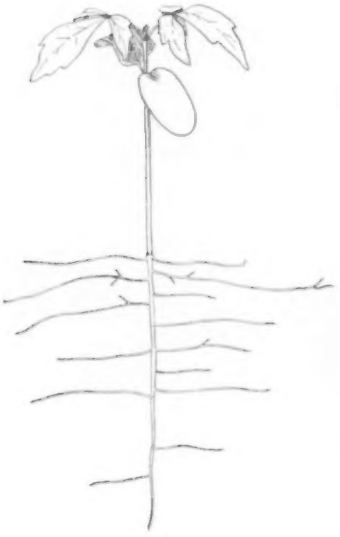
Poison ivy is a woody plant. Unfortunately it shows tremendous variation in the way it grows and in its leaf characteristics (particularly leaflet size and waviness or toothing of edge). It may grow either as an erect shrub or as a vine climbing by aerial rootlets on fences, walls, or trees, or it may spread over the ground. Its leaves are arranged alternately (one at a node) and are compound, with three leaflets (figure 1). These three leaflets on a leafstalk are usually referred to as "leaves in groups of threes." The leaves may have a glossy or dull surface or may even be somewhat hairy, especially on the lower surface. The edges of the leaves are either smooth, toothed, or somewhat lobed. When a leaf is broken off, a crescent-shaped scar is left on the twig, above which a light-brown bud can be seen. The small greenish white flowers appear in clusters in the axils of the leaves.

Stay away from any suspicious plant whether it be vine, bush, or creeper until you have checked the leaf arrangement. Under conditions that are poor for its growth, poison ivy may form small, spindly, trailing branches which are well hidden in the other vegetation. Be especially watchful for these.

The clusters of small, round, waxy, white, berry-like fruits appear in late summer and often persist all winter. The seeds of poison ivy germinate freely. The seedlings soon produce creeping stems or rootstocks from the lowest nodes (figure 2).

FIGURE 1. POISON IVY, RHUS TOXICONDENDRON L.

A branch showing leaves and flower clusters on the new growth and clusters of berry-like fruits persisting on the growth of the preceding year



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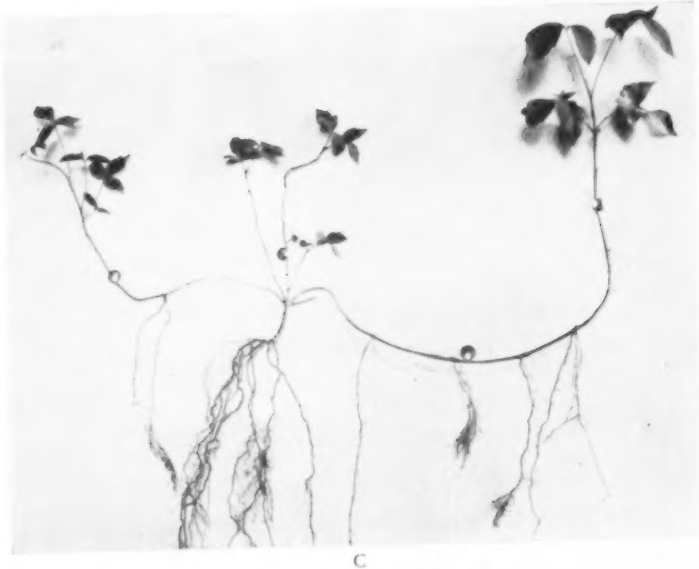

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FIGURE 2. SEEDLING OF POISON IVY, RHUS TOXICONDENDRON, SHOWING DEVELOPMENT DURING FIRST TWO YEARS

A, Seedling; x 1; 12 days old, May 6, 1932. B, The same seedling showing the beginning of the first rootstock x 1/3. Photographed August, 1932. C, The same seedling with well-developed rootstocks and adventitious roots; x 1/6. Photographed September, 1933

Distinguishing Characteristics

The alternate leaves each with three leaflets will help you to identify poison ivy. In autumn and winter the clusters of white fruits make identification certain. The Virginia creepers, or woodbines, have five or more leaflets on a leaf and in late summer have clusters of blue berries (figure 4). The fragrant sumac also has three leaflets on each leaf; but when a leaf is broken from the twig, it leaves a circular scar on the twig with no bud visible above it; its fruits are red and in terminal clusters. The fragrance of the broken twigs also distinguishes it from poison ivy.

Distribution and Habitat

Poison ivy is common throughout New York State, but it is especially abundant in dry, rocky soil, in thickets along the edges of fields, woods, roads, and paths. The climbing form is common in low, rich woodlands.

Poisoning

Much false information is in general circulation concerning the nature and treatment of *Rhus* poisoning. Extravagant claims for the value of numerous preparations for the prevention or treatment of cases have been made from time to time, and some of these have their foundation in medical experimentation which seemed at first to show them useful. In such experiments, patients who have had serious cases of ivy poisoning are usually chosen. Such persons generally avoid poison ivy plants much more carefully than the average person, and any medication that they employ therefore usually appears to be beneficial. No preparation yet discovered cures or completely prevents the occurence of poison-ivy symptoms in sensitive individuals.

The poisonous principle

The poisonous principle is found only in the sap of the plant. It is secreted into special canals which are formed in each year's new growth just below the surface of the bark and in all other parts including the smallest roots and twigs, the leaves, the flowers, and even the seeds. *One must come in contact with this sap to be poisoned.* Touching the *unbroken* surface of any part of the plant will not produce poisoning, but dried sap may be on the surface of any part of the plant at any time through the tearing of leaves or the breaking of bark by wind, animals, and the like at some previous time. Although the plant is poisonous throughout the year, most cases of poisoning are in the early spring when the young easily bruised leaves are forming. After the leaves fall in the autumn, the bare stems must be bruised to produce poisoning, and cases are less frequent.

The poisonous principle, urushiol, is contained in a part of the sap that is resinous in nature and not water soluble. Its resinous nature causes it to stick to, and dry firmly onto, anything with which it comes in contact. It is very much like a lacquer in this respect. Recently, chemists have been able to break crude urushiol into four closely related molecules, and the com-

plete structure of each has been worked out. Potency has been found to depend upon certain variations in structure (amount of double bonding) in these molecules. These same molecules, or ones closely related to them, are found also in cashew-nut-shell oil, in Japanese lac, and in poison sumac.

Pollen grains do not contain any of the poisonous sap, and wind blowing past the plant *cannot* produce poisoning unless it is strong enough to carry plant fragments with it. The tiny particles of ash that make up smoke from burning plants can, however, carry microscopic droplets of the sap. Nevertheless direct contact with the plant is the most common method of exposure. Anything that has been in contact with the plant, such as clothing, tools, and animals, can also bring the poisonous principle to your skin.

The poisonous principle must penetrate the outer surface of the skin (keratin) before poisoning will result. Since penetration is most easily made where the skin is thin, slight poisoning often appears between the fingers or on the thin skin of the neck, eyelids, undersurface of the arms, and the like. Seldom is there any poisoning on the soles of the feet or palms of the hand or on parts of the body heavily covered with hair.

Surprisingly small amounts of the poisonous principle cause reaction in particularly sensitive individuals. Experiments have been made to determine how long the sap retains its toxicity. For instance, leaves of poison ivy stored for five years at room temperature were found to be just as toxic as when they were fresh. Branches left outdoors on a garage roof for 18 months still proved highly dangerous. Clothing has been shown to carry the poisonous principle for well over a year. A white canvas glove worn during collection of poison ivy was stored at room temperature for 10 months, then washed for 10 minutes with hot water and laundry soap, then pressed and dried with a hot iron; it still caused poisoning and there was no apparent decrease in its potency. Poison-ivy twigs kept in water for 16 months still were dangerous. Even boiling the extracted sap for 12 hours did not completely destroy its toxicity. In another experiment, a doctor who had collected poison ivy washed his hands thoroughly in strong soap for several minutes every hour. After six hours they retained enough toxic material to cause a reaction on sensitive skin.

The extreme stability of the toxic sap means that one should be just as careful in handling either fallen leaves or dead stems as if they were still alive. A sensitive person should never stand within range of the smoke of any pile of debris that might contain parts of the poison ivy plant.

Effect of the poison

The poisonous sap in contact with the skin can do two things. Severe dose of the poison acts directly as an irritant, producing a redness similar to that produced by a weak solution of lye. Secondly, regardless of dose, the sap always acts as a sensitizer. When

it contacts the skin the first time, it does not cause an immediate outbreak of poison ivy. Instead, it causes an unseen reaction within the skin. A second exposure to the poisonous principle will then cause the characteristic eruptions of poison ivy. The size of the area of skin made sensitive by the first contact depends upon a number of factors including the amount of sap, the amount of skin that the sap touches, the length of time that the sap remains in contact with the skin, and the susceptibility of the individual.

Large numbers of persons become sensitized in childhood. The sensitivity built up in an individual can vary widely, but there is probably no one, once exposed, who has no sensitivity to massive doses. Cases are fairly common in which a person who has been relatively insensitive to poison ivy for a long time becomes much more sensitive to it after a massive sensitizing exposure. On the other hand, there is some reason to believe that if you stay away from poison ivy for a long time, your sensitivity will reduce over the years. People who have had severe cases of poison ivy as children, but who learned to stay away from it most of their lives, have been found to be much less sensitive in later years.

Active patches of poison-ivy eruptions supersensitize the area of skin where they occur. Extremely small amounts of the poisonous principle cause flare-ups of poison ivy in these spots after they have healed. Supersensitivity slowly goes away, but occasionally lasts for as long as a year. Supersensitive areas may also react to other plants which would not normally cause trouble. Reaction of supersensitive spots to minute amounts of the poisonous principle on clothing, tools, and the like explains cases in which a person gets poison ivy even though he is absolutely positive he has not been near the plant.

Treatment

Poison ivy is a self-limiting disease. Affected skin heals after a time without any treatment if no more of the poisonous principle comes in contact with the skin. Little can be done to hasten or change the course of the disease once it has started.

In no case is the old saying that an ounce of prevention is worth a pound of cure truer than with poison ivy. *If you are sensitive to poison ivy, learn to recognize it in all its forms and then stay away from it.* The pictures, drawings, and descriptions in this bulletin will help you to identify poison ivy. Further help can be obtained from your county Extension agent's office or from the person who teaches Biology or Agriculture in your high school. If you have to go into an area where poison ivy grows, wear substantial clothing over all parts of the body that might touch the plant. If you are going to handle the plant, wear plastic or rubber gloves. When finished, remove the clothing carefully so as not to touch the outside of it with any part of your body. Launder it thoroughly, or send it to a laundry, before you put it away.

If you know you have come in contact with the plant, wash any possible

area of contact vigorously with strong kitchen soap for several minutes and repeat this washing several times. It is very important to do this just as quickly as possible after contacting the plant. It must be done within five or ten minutes to reduce or eliminate eruptions in most persons. Treatments formerly recommended, such as with potassium permanganate, sodium perborate, ferric chloride, the juice of Jewel Weed, and the like, have not been shown to be more effective than washing as described above and in general can be expected to be less effective.

If eruptions appear, the best treatment is that which relieves the itching. Scratching is dangerous because it further injures the skin causing the eruptions to take longer to heal and inviting infection. (Poison ivy can be spread by scratching through transfer of the poisonous principle from the surface of one part of the skin to another.) The watery fluid formed *in* the blisters is free of the poisonous principle. Recommended treatments include the application of Burow's solution (in a dilution of 1 to 20) in the form of wet packs, the application of Calamine lotion, and the application of heat with hot compresses. If large areas of the skin are involved, or if the individual blisters are large, a physician should be consulted. He can prescribe ointments to relieve the itching and, in severe cases with large watery swellings, the new prescription drug, cortisone, may prove effective.

If your occupation requires you to come in constant contact with poison ivy, seek the advice of a dermatologist (a doctor who specializes in skin diseases). After determining your level of sensitivity, he may decide to administer increasing doses of an extract of the poisonous principle until an immunity has been built up to the amounts of poison ivy likely to be encountered. Extracts commercially available vary widely in strength, but treatments like this, using extracts of standardized potency, have been successful in many cases.

Eradication

Poison ivy persists and spreads, when once established, by means of its creeping stems and rootstock. An effective method of eradication should destroy both the aerial and subterranean parts, either directly or indirectly. Which of the suggested control methods will be most useful depends in part upon the circumstances under which the poison ivy is growing. In any application, parts of plants may be missed. Watch the area carefully and repeat the application if you observe any new growth.

1. Spray or sprinkle with a solution of 2,4,5–T or a mixture of 2,4–D and 2,4,5–T. The use of 2,4,5–T alone is somewhat more effective, but is more expensive. Use the dosages recommended by the manufacturer and follow the procedure outlined on the container. Both of these chemicals kill many other broad-leaved plants. Avoid getting them on desirable plants.

Sprayers that have contained 2,4–D or 2,4,5–T should not later be used to

spray ornamental plants. Even after careful cleaning they may retain enough chemical to do damage.

2. If poison ivy is scattered among other desirable plants which cannot be avoided in spraying, apply 2,4,5–T in an oil mixture to the basal part of the stem. The material should be applied all around the stem up to 6 to 10 inches and around the groundline area. A watering-can may be used. If the stem is very thick, cut it in several places with an ax.

3. Spray or sprinkle with a solution of ammonium sulfamate ("Ammate"). The solution is made by mixing 1 pound of dry chemical with 1 gallon of water. Apply it to the fully developed leaves at the rate of 1 to 2 gallons on 1 square rod of vegetation. Weaker applications, instead of killing, may stimulate growth. "Ammate" kills most vegetation. It can be used for poison ivy growing on and around trees if none of the spray get on the tree leaves. "Ammate" is expensive for large areas.

4. Experiments in progress at the New York State College of Agriculture and elsewhere indicate that the chemical, aminotriazole, is an effective control agent for poison ivy. It should be applied at the rate of 1 pound in 6 gallons of water, sprayed on until all leaves are dripping wet. Although it is selective for poison ivy to a greater degree that the other chemicals mentioned, it can damage other broad-leaved vegetation at this rate of application. It has the advantages of being cheaper and more effective than the other chemicals.

5. Small areas may be held in check if grazed closely by sheep, goats, or cattle. Poison ivy does not seem to be injurious to these animals.

6. If no obstacles are present, mow the ivy near the surface of the ground, preferably during July and August. Follow by fall plowing and harrowing. Plant a cultivated crop in that area next season. In this way new shoots can be kept out and the subterranean parts starved.

Poison Sumac

(*Rhus Vernix* L.)

Other names: *swamp sumac, poison elder, poison dogwood, poison ash, thunderwood.*

Description

Poison sumac is a tall erect shrub or small tree with gray bark. The leaves are arranged alternately and are pinnately compound, with about seven to thirteen leaflets; the leafstalks are reddish and usually turned forward; the leaflets are smooth and have an edge without indentations (figure 3). The leaves become brilliantly colored in late summer or early autumn. The axillary clusters of small greenish flowers later develop into drooping fruits. The seedlings of poison sumac, during the first year, have leaves similar to those of poison ivy, with three leaflets. During the second year they produce pinnately compound leaves so characteristic of adult bushes (figure 3). Poison-sumac seedlings do not produce rootstocks like poison ivy does.

FIGURE 3. POISON SUMAC, RHUS VERNIX L.

A branch showing leaves and drooping clusters of berry-like fruits which may persist all winter

FIGURE 4. THE PRINCIPAL CHARACTERISTICS OF THE LEAVES OF POISON IVY AND POISON SUMAC AND SOME HARMLESS PLANTS WITH WHICH THEY ARE OFTEN CONFUSED

1, Poison ivy, *Rhus toxicodendron* L. Leafstalk bearing three leaflets; buds visible. 2, Virginia creeper, *Parthenocissus quinquefolia* (L.) Planch. Leafstalk bearing five leaflets. 3, Silky dogwood, *Cornus Amomum* Mill. Leafstalk with one blade, leaves opposite (in pairs). 4, Fragrant sumac, *Rhus canadensis* Marsh. Leafstalk bearing three leaflets; buds hidden under base of leafstalk. 5, Poison sumac, *Rhus Vernix* L. Leves alternate (one at a node); leafstalk bearing several leaflets with smooth margins; buds visible. 6, Dwarf sumac, *Rhus copallina* L. Margin of leaflets smooth or toothed, leaf leafstalks. 8, Staghorn sumac, *Rhus typhina* L. Like 7, but leaves and twigs are hairy. 9, Mountain axis winged. 7, Smooth sumac, *Rhus glabra* L. Margin of leaflet toothed, buds hidden under base of ash, *Sorbus americana* Marsh. Margin of leaflets toothed; buds visible. 10, Black ash, *Fraxinus nigra* Marsh. Leaves and buds opposite (in pairs). 11, Elderberry, *Sambucus canadensis* L. Leaves and buds opposite

Distinguishing Characteristics

Poison sumac can be distinguished from all other plants with which it is confused by its alternate, pinnately compound leaves with smooth edges (figure 4). The common nonpoisonous sumacs all have terminal clusters of red or brown fruits; of these, staghorn sumac (*Rhus typhina*) and smooth sumac (*Rhus glabra*) have toothed leaflets; dwarf sumac (*Rhus copallina*) may have leaves with toothed or smooth leaflets, but the stalk to which the leaflets are attached is flattened or winged. The true ashes (*Fraxinus*) and elderberries (*Sambucus*) have opposite compound leaves. The mountain ash (*Sorbus*) has alternate pinnately compound leaves, the leaflets of which have fine sharp teeth along their edges.

Distribution and Habitat

Poison sumac is found locally, except in the higher elevations of the Adirondack Mountains, throughout the greater part of New York State. It is limited almost entirely to swamps; only rarely does it occur on dry ground around their margins.

Poisoning

The poisonous principle, urushiol, is the same as in poison ivy. The methods of treatment given under poison ivy can therefore be used also in cases of poisoning from poison sumac.

Eradication

Since poison sumac, for the most part, grows as clumps of bushes or small trees in rather inaccessible swampy thickets, seldom is an effort made to eradicate it. Sometimes it is desirable to remove clumps of poison sumac from the edges of roads, paths, or from blueberry bogs where there is danger of persons coming in contct with it.

Solutions of 2,4–D, 2,4,5–T, and ammonium sulfamate can be used as for poison ivy. From 10 to 20 pounds of rock salt scattered about the base of each clump kills sumac.

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